AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings of claims in the application.

1-4. (Canceled)

5. (Currently Amended) A method of compressing a still image ~~said method~~ comprising: ~~the steps of~~:

identifying at least one catastrophe in said image;

representing said catastrophe with a canonical polynomial; and

transforming said canonical polynomial into datery.

6. (Canceled)

7. (Currently Amended) A method of compressing an image~~, said method~~ comprising: ~~the steps of~~:

segmenting the image into blocks of pixels;

creating a canonical polynomial surface for at least one catastrophe in at least one of said blocks of pixels; and

sending ~~the~~ coefficients of said at least one canonical polynomial as compressed data.

8. (Canceled)

9. (Currently Amended) The method of claim 7~~as defined in claim 8~~, further comprising ~~the step of~~:

creating a modeled surface of the~~said~~ image with ~~said at least one~~ the canonical polynomial, said modeled surface being isomorphically related to the~~said~~ image.

10-31. (Canceled)

32. (Currently Amended) The method of claim 7~~,6~~ wherein a model image is generated from said canonical polynomial which is a best match canonical polynomial selected based on a difference between an ~~the~~ original image and said model image.

33. (Currently Amended) The method of claim 7, wherein a model image is generated from said canonical polynomial which is a best match canonical polynomial selected based on a difference between the original still image and said model image.

34-35. (Canceled)

36. (Currently Amended) The method of claim 33,~~35~~ wherein said difference is calculated using the equation:

~~$$Q = \sqrt{\frac{1}{MN}\sum_{x=0}^{M-1}\sum_{y=0}^{N-1}(io(x,y) - im(x,y))2}$$~~

$$Q = \sqrt{\frac{1}{MN}\sum_{x=0}^{M-1}\sum_{y=0}^{N-1}(i_0(x,y) - i_m(x,y))^2},$$

wherein Q is the difference, M is the number of rows in an image, N is the number of columns in the image, x is an x-coordinate of a pixel, y is an y-coordinate of the pixel, i_0 is a function that returns a pixel from a segment of the original still image, and i_m is a function that returns a pixel from a segment of the model image.

37-40. (Canceled)

41. (Currently Amended) The method of claim 33,~~40~~ wherein a transformation is applied to said selected canonical polynomial to obtain a function describing a model surface.

42. (Currently Amended) The method of claim 41, wherein said transformation is a non-homogeneous linear transformation.

43. (Currently Amended) The method of claim 42, wherein said non-homogeneous linear transformation takes the form:

$$f_{canonical} = x_1^3 + x_1 x_2,$$

wherein x_1 takes the form:

$$x_1 = (y_1 + a_1 y_1^2 + ... a_n y_n^2);$$

and

wherein x_2 takes the form:

$$x_2 = (y_2 + b_2 y_2^2 + ... b_n y_n^2).$$

44-45. (Canceled)

46. (Currently Amended) A method of imaging compression comprising: ~~the step of~~

segmenting an image into a plurality of segments; and

compressing the image by characterizing aspects of segments of the image ~~an image to be compressed~~ with singular manifold representations represented by canonical polynomials.

47. (Currently Amended) The method of claim 46, wherein said aspects are surfaces of objects.

48. (Canceled)

49. (Currently Amended) The method of claim 46,~~48~~ further comprising the step of reducing said polynomials to compact tabulated normal form polynomials which comprise simple numbers.

50. (Currently Amended) A method of still image encoding comprising the following steps:

(a) capturing a frame;

(b) dividing said frame into segments of pixels;

(c) determining the dynamic range of a segment by subtracting the intensity of the pixel having maximum intensity from the intensity~~intentsity~~ of the pixel having minimum intensity in said segment;

(d) comparing said dynamic range to a threshold below which said segment is likely to represent background;

(e) selecting a canonical polynomial from a table if said threshold in (d) above is exceeded;

(f) compressing said segment using standard texture compression techniques and storing the result if the threshold of step (d) is not exceeded;

(g) performing a transformation on said canonical polynomial to obtain an equation representing a modeled surface;

(h) substituting the coordinates of each pixel from said segment into said equation representing said modeled surface to obtain a matrix of modeled surface elements of said segment;

(i) calculating the overall quality of the modeled surface of said segment compared with said original segment by (1) subtracting the difference between the pixels of said original segment and corresponding pixels of said modeled surface (2) squaring said differences (3) summing up all of said squares and (4) taking the square root of said sum to arrive at a quality determination for said modeled~~modelled~~ surface;

(j) comparing said quality determination of step (i) to a predetermined threshold;

(k) selecting new coefficients for said canonical polynomial if said quality determination is greater than said predetermined threshold of step 0) and repeating steps (i) and 0) until a best quality determination, less than said predetermined threshold of step (i) is achieved;

(l) storing said best quality determination for said canonical polynomial and said coefficients that produced said best quality determination;

(m) repeating steps (f-1) for polynomials not yet tested until all canonical polynomials from said table have been tested for said segment;

(n) determining the polynomial having the overall best quality determination of the polynomials tested for said segment to arrive at a selected polynomial for said segment;

(o) storing the coefficients for said selected polynomial representing a model surface for said segment;

(p) selecting a next segment of said frame and performing steps (c) through (o) on all such next segments until all segments of the frame have been selected;

(q) calculating the average distance between said model surface of said segment and each adjacent segment of said frame to determine if connections to neighboring segments can be made;

(r) comparing the average distances determined in the preceding step to a threshold average distance;

(s) extending said model surface to adjacent segments if the average distance between such segments is less than said threshold average distance;

(t) calculating a spline to approximate the surface of adjacent segments if the average distance for any such segment exceeds said threshold average distance to form a graph;

(u) constructing a model image of the entire frame by creating a table of all of the data representing the modeled~~modelled~~ segments to obtain a matrix describing the entire modeled frame surface;

(v) calculating the peak signal to noise ratio over the entire frame;

(w) comparing the peak signal to noise ratio of the entire frame to a signal to noise threshold;

(x) calculating a difference frame by subtracting the value of each pixel of the model image from each pixel of the original captured frame if the peak signal to noise ratio exceeds said signal to noise threshold;

(y) compressing the difference frame, if any, using standard lossy compression methods; and

(z) compressing the frame data comprising the coefficients for said selected polynomials, and said compressed difference frame, if any.

51. (Currently Amended) The method of claim 50, further comprising applying a non-homogeneous linear transformation to obtain said matrix of modeled~~modelled~~ surface elements of said segment.

52. (Currently Amended) The method of claim 50, further comprising applying a homogeneous linear transformation to obtain said matrix of modeled~~modelled~~ surface elements of said segment.

53. (Currently Amended) The method of claim 50, further comprising applying a non-homogeneous nonlinear transformation to obtain said matrix of modeled~~modelled~~ surface elements of said segment.

54. (Currently Amended) The method of claim 50, wherein said step of segmenting said frame into blocks of pixels comprises segmenting into blocks that are fixed in size.

55. (Currently Amended) The method of claim 50, wherein said step of segmenting said frame into blocks of pixels comprises segmenting into blocks that are variable in size.

56-62. (Canceled)